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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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QIN, YIXING

ART UNIT	PAPER NUMBER
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2625

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/06/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



**DETAILED ACTION*****Response to Amendment***

In response to applicant's amendment received 11/13/06, all requested changes have been entered.

***Response to Arguments***

Applicant's arguments filed 11/13/06 have been fully considered but they are not persuasive. The first argument is with regards to the Official Notice of the calculation of the cumulative number of prints and the storage of this number. As the Examiner previously explained, the Midgley reference does not explicitly disclose this limitation, but provides enough information to calculate the cumulative number of prints. The "Y" value that the Examiner was referring to was intended to be the maximum "Y" value – the maximum image count of a new cartridge as stated in column 5, lines 41-43. Using this value, one knows the maximum number of prints a cartridge can print. The Examiner realizes the Midgley reference is using the same variable, Y, and decrements itself, but all the relevant information was there for one to figure out the total number of prints printed. For example, if the cartridge came with 100 prints, and then continuously got decrement to 25 prints, then one knows that 75 prints have been cumulatively printed. Basically, the Midgley reference prefers to count down from a maximum number to 0 prints, while the applicant's invention counts upwards from 0 to a maximum terminal count.

The Examiner acknowledges that various common components arranged in particular ways can constitute patentable inventions, but in the instant case, we are

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talking about calculating values, and one of ordinary skill would know how to calculate a cumulative count given the information from the Midgley reference. And, yes, the Official Notice was meant for the calculation aspect of the invention, the addition/subtraction of values to obtain a cumulative count. It was not the Examiner's intention to Official Notice the "storing of cumulative number of prints..." The Official Notice was meant for the calculation of such a value.

Regarding the preferential storage of the cumulative count in a printer memory or a cartridge memory, the Examiner acknowledges the applicant's arguments. However, the storage of information in a particular area is known in the art and one of ordinary skill knows the advantages of storing information (in this case the cumulative count) in certain memories in certain locations. Even the type of memory matters, either volatile or nonvolatile, depending on whether the information needs to be kept or is freeing up space more useful. Nevertheless, the Examiner points to Beard et al (U.S. Patent No. 6,016,409 – column 2, lines 25-35) to show that information regarding the total number of printed pages has been known to be kept in a printer's memory. From the above responses, there is enough information in the cited references to teach/suggest all of the claims. The rejection is maintained.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims 1, 25, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Midgley (U.S. Patent No. RE 35,751) in view of Official Notice.

Regarding claims 1 and 25, Midgley discloses an image forming apparatus comprising:

an apparatus body; (Fig. 6)

image forming means at least partly implemented by a replaceable part, which is removably mounted to said apparatus body; (column 3, lines 17-27 - toner cartridges 12, 14 and 16. One can see in Fig. 6 they are mounted on the machine 10.)

counting means for counting prints sequentially output with the replaceable part; (column 6, lines 23-29 - counting of prints in a printing run and the temporary storage of this count in RAM 103.

storing means and first writable and readable nonvolatile storing means built in said apparatus body; (Fig. 1 – ROM 102)

second writable and readable nonvolatile storing means built in the replaceable part; (column 5, lines 37-40 - memories for each cartridge. Column 5, line 15 identifies 90 as an EEPROM) and

Midgley generally discloses the following limitation:

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control means for storing a limit number of prints particular to the replaceable part in said first nonvolatile storing means, storing, after an image forming operation, a cumulative number of prints printed by said replaceable part in said storing means at least until the replaceable part is replaced with a different replaceable part and in said second nonvolatile storing means, and reporting a time for replacing said replaceable part when said cumulative number stored in said storing means exceeds said limit number of prints stored in said first nonvolatile storing means. (column 6, lines 11-15 – comparison as to see whether the cartridge has reaches its end of life. Column 6, lines 26-37 – a count is made of the total number of prints and stored in the RAM 103 and the memory 90 of each toner cartridge 12, 14 and 16 are appropriately updated. Column 6, lines 41-47 – warning message telling the user that a cartridge's lifetime is about to be up.

It does not explicitly disclose "...storing, after an image forming operation, a cumulative number of prints printed by said replaceable part in said storing means at least until the replaceable part is replaced with a different replaceable part and in said second nonvolatile storing means..."

However, as mentioned in the arguments above, Midgley discloses in column 5, lines 41-43 that each cartridge is pre-programmed with a max number of pages that can be printed, Y. Column 6, lines 23-47 discloses how a "new current image count" value is calculated. This value reflects the number of prints left that a cartridge can make. The Examiner takes Official Notice that "...storing, after an image forming operation, a cumulative number of prints printed by said replaceable part..." is calculated using the

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addition/subtraction of numbers, which is well-known. From the Midgley reference, obtaining this cumulative value of prints printed is a manipulation of numbers based upon a simple addition formula, that  $[\text{cumulative printed}] + [\text{current image count}] = \text{total number of prints, Y}$ . By subtracting the new current image count from Y, one obtains the cumulative number of counts that has been made. The storage of this value in a memory would be inherent since a number cannot exist abstractly on a machine, and would be a matter of preference as to which memory would store this value.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used information from the Midgley reference to figure out a cumulative number of prints printed value prior to the replacement of a cartridge since the Examiner takes official notice that the calculation of a count of prints printed is based upon a simple addition/subtraction formula using the information provided by Midgley.

The motivation would have been to allow a printing machine to keep track of the number of prints so that it can properly warn a user to replace a cartridge.

Therefore, it would have been obvious to use Midgley to obtain the invention as specified.

Regarding claims 41 and 42, Midgley discloses an IC (Integrated Circuit) chip to be connected to a CPU (Central Processing Unit) built in an apparatus body of an image forming apparatus when removably mounted to said apparatus body, and

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including nonvolatile storing means allowing data to be written therein or read thereout of under control of said CPU, said nonvolatile storing means stores ID information particular to said IC chip and a cumulative number of prints output by said apparatus body with said IC chip, (Fig. 8 and column 5, lines 3-8 – cartridges have a terminal board 97 – i.e. an IC – that is used to connect to the machine control unit – MCU 100 of Fig. 1 – of the printer. Also note column 5, lines 16-20. Column 6, lines 11-15 and 29-37 disclose the reading of count information from the IC chip by the MCU.)

the ID information and the cumulative number of prints are read out of said storing means and transferred to said apparatus body when said IC chip is mounted to said apparatus body, (column 5, lines 66-67 to column 6, lines 1-2 discloses that an ID number could be read. One knows this ID number would be stored in the memory 90. ) and

Midgley discloses in column 6, lines 23-37 discloses the updating of the print counts to help determine the life of a cartridge. Line 30, especially, discloses the fetching of the count from the memory 90 of the cartridge in order to calculate a new count. Midgley discloses the time for replacing in column 6 lines 38-47. Line 38 discloses that this check is for replacement is prior to the returning of cumulative information to the cartridge.

It does not explicitly disclose "after management information including the cumulative number of prints have been processed, an existing cumulative number of prints stored within the apparatus body at least until the IC chip is removed and



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replaced with a different IC chip is updated by the cumulative number of prints transferred from said IC chip."

However, as mentioned in the arguments above, Midgley discloses in column 5, lines 41-43 that each cartridge is pre-programmed with a max number of pages that can be printed, Y. Column 6, lines 23-47 discloses how a "new current image count" value is calculated. The Examiner takes Official Notice that "...storing, after an image forming operation, a cumulative number of prints printed by said replaceable part..." is calculated using the addition/subtraction of numbers, which is well-known.. From the Midgley reference, obtaining this cumulative value of prints printed is a manipulation of numbers based upon a simple addition formula, that  $[\text{cumulative printed}] + [\text{current image count}] = \text{total number of prints}$ , Y. By subtracting the new current image count from Y, one obtains the cumulative number of counts that has been made. The storage of this value in a memory would be inherent since a number cannot exist abstractly on a machine, and would be a matter of preference as to which memory would store this value.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used information from the Midgley reference to figure out a cumulative number of prints printed value prior to the replacement of a cartridge since the Examiner takes official notice that the calculation of a count of prints printed is based upon a simple addition/subtraction formula using the information provided by Midgley.

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The motivation would have been to allow a printing machine to keep track of the number of prints so that it can properly warn a user to replace an IC chip.

Therefore, it would have been obvious to use Midgley to obtain the invention as specified.

II. Claims 2-4, 7, 8, 10-12, 18, 19, 22, 26-28, 31, 34, 35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Midgley (U.S. Patent No. RE 35,751) in view of Kawano et al (U.S. Patent No. 5,012,286 – “Kawano”).

Regarding claims 2, 10, 26, Midgley discloses the identification of a cartridge

It does not explicitly disclose “wherein said control means stores ID (identification) information of an individual replaceable part in said second nonvolatile storing means, transfers said ID information to said storing means when said replaceable part is used, reads said ID information out of said second nonvolatile storing means when said replaceable part is mounted to said apparatus body, and updates, if said ID information is not identical with ID information particular to a previous replaceable part stored in said storing means, contents of said storing means with the number of prints and said ID information stored in said second nonvolatile storing means.”

However, the secondary reference, Kawano discloses in column 7, lines 60-67 and column 8 line 1 that there is no need for updating if the developing units is the same

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– hence, an update is needed when a new developing unit is put in. One would understand that the storage of this information in any writable memory is possible, depending on where the related information to this ID is stored.

Midgley and Kawano are combinable because both references are in the art of detection of needed replacement of consumables in a printer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an updating mechanism in Midgley to store updated information from a cartridge.

The motivation would be to allow different types of cartridges to be used.

Therefore, it would have been obvious to combine Midgley and Kawano to obtain the invention as specified.

Regarding claims 3, 7, 11, 18, 27, 34, and 38, Midgley discloses in column 6, lines 26-37 that a count is made of the total number of prints and stored in the RAM 103 and the memory 90 of each toner cartridge 12, 14 and 16 are appropriately updated.

It does not explicitly disclose "...further comprising means for allowing the limit number of prints to be variably written to said first nonvolatile storing means."

One skilled in the art knows that the prints from each new job that occurs can be different, i.e. variable, so a variable number can be written to the RAM during different print jobs.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have allowed a variably written limit number.

The motivation would have been to enable variable types of cartridges to be used.

Therefore, it would have been obvious to combine Midgley and Kawano to obtain the invention as specified.

Regarding claims 4, 8, 12, 19, 22, 28, 31, and 35, the technique Midgley describes in column 6, lines 23-37 is using a decrementing system instead of an incrementing system as being claimed.

It does not explicitly disclose "...wherein said controller corrects, in accordance with an image forming condition, a count sequentially incremented for determining the cumulative number of prints."

However, It would be obvious for one to simply alter the decrementing system to act like an incrementing system because they are simply counting numbers in different directions.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used an incrementing instead of a decrementing system.

The motivation would have been simple preference in the usage of a numbering system.

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Therefore, it would have been obvious to use Midgley to obtain the invention as specified.

III. Claims 5, 6, 9, 13, 14, 16, 17, 20, 21, 23, 24, 29, 30, 32, 33, 36, 37, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Midgley (U.S. Patent No. RE 35,751) in view of Kawano et al (U.S. Patent No. 5,012,286 – “Kawano”) and further in view of Samuels (U.S. Patent No. 5,937,225).

Regarding claims 5, 13, 16, 20, 23, 29, 32, 36, and 39, the Midgley and Kawano references discloses ways for detecting consumables in a printer.

They do not explicitly disclose “...wherein the image forming condition is based on image density.”

However, Samuels, discloses in column 1, lines 66-67 and column 2, lines 1-4 that the density would be a factor in determining the number of counts.

All references are combinable because they are in the art of detection of needed replacement of consumables in a printer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used image density as a criteria for determining the number of sheets that can be printed.

The motivation would have been to take into account that some prints would require more resources and properly adjust the replacement period for a cartridge.

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Therefore, it would have been obvious to combine all three references to obtain the invention as specified.

Regarding Claims 6, 9, 14, 17, 21, 24, 30, 33, 37, and 40, the Midgley and Kawano references disclose ways for detecting consumables in a printer.

They do not explicitly disclose "wherein the image forming condition is based on a resource and energy save mode available for image formation."

However, Samuels suggests from claim 5 above and column 3, lines 38-49 that density and pixel count are two factors in determining the overall life of the cartridge. One skilled in the art would know that a common resource save mode is draft printing, which one knows is of a lower quality or resolution (i.e. less density or lower pixel count).

All references are combinable because they are in the art of detection of needed replacement of consumables in a printer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a resource saving mode in determining the lifespan of a cartridge.

The motivation would have been to take into account that some prints would require less resources and properly adjust the replacement period for a cartridge.

Therefore, it would have been obvious to combine all three references to obtain the invention as specified.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yixing Qin whose telephone number is (571)272-7381. The examiner can normally be reached on M-F 9:30-6:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on (571)272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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